



(19)

(11) Publication number:

5

Generated Document.

PATENT ABSTRACTS OF JAPAN

(21) Application number: 53061495

(51) Intl. Cl.: H01L 21/22 H01L 21/324

(22) Application date: 22.05.78

(30) Priority:

(43) Date of application
publication: 30.11.79(84) Designated contracting
states:

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(54) PREVENTING METHOD FOR OCCURRENCE OF CRYSTAL DEFECT OF SILICON SINGLE-CRYSTAL SUBSTRATE

(57) Abstract:

PURPOSE: To prevent the occurrence of a crystal defect by forming diffusion strain by diffusing atoms, different in atom radius of Si, to the circumference of the other main surface of a Si single-crystal substrate in a belt shape.

CONSTITUTION: On the top and reverse surfaces of a Si single-crystal substrate, oxidized films 2 and 3 are formed. In oxidized film 2 on a main surface other than a surface where a semiconductor element is to be formed, two opening parts 4 and 5 of approximately 250µm in width are concentrically formed, at an interval of approximately 50µm, approximately 4mm away inward from the external circumference. Through opening parts 4 and 5, atoms, differing in atom radius from Si, such as Sb atoms are

thermally diffused to a surface density of 1019/cm³ and a depth of 5μm approximately so as to form diffusion regions 6 and 7. In consequence, diffusion strain is generated in the Si substrate. Then, oxidized films 2 and 3 are removed. The substrate formed by the above method is oxidized for about thirty minutes in a vapor atmosphere of 1140°C. Consequently, a region without strip lines is expanded to a degree of 90%, so that great improvement can be realized.

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